LIU & LIU
ATTORNEYS AT LAW

CITIGROUP CENTER, SUITE 1750
444 SOUTH FLOWER STREET
LOS ANGELES, CALIFORNIA 90071 USA
TEL: (213) 830-5740
FAX: (213) 830-5741
www.liulaw.com

To:	Examiner John A. McPherson (GAU 1756) USPTO	**From:**	Julie Nguyen
Fax:	(571) 273-8300	**Pages:**	20
Phone:	(571) 272-1386	**Date:**	1/20/2006 2:43 PM
Re:	Serial No.: 10/773,624 Our Docket No.: 1176/201	**CC:**	

☒ **Urgent** ☒ **For Review** ☐ **Please Comment** ☒ **Please Reply** ☐ **Please Recycle**

• **Comments:**

Please see the attached documents:

1. Transmittal for Appeal Brief;
2. Appeal Brief; and
3. Credit Card Payment Form PTO-2038.

PATENT
Docket No.: 1176/201

CERTIFICATE OF TRANSMISSION BY FACSIMILE

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office Fax No. (571) 273-8300 on January 20, 2006.

Julie Nguyen

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Cheng

Serial No.: 10/773,624

Filing Date: February 6, 2004

For: METHOD OF FABRICATING SUBSTRATE WITH COLOR FILTER

Examiner: McPherson, John A.

Group Art Unit: 1756

TRANSMITTAL FOR APPEAL BRIEF

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Transmitted herewith is an Appeal Brief to the Board of Patent Appeals and Interferences from the August 19, 2005 Final Office Action in the above-referenced patent application:

☐ No additional fee is required.

☒ Other enclosures: Credit Card Payment Form PTO-2038

01/23/2006 MBINAS 00000036 10773624
01 FC:1402 500.00 OP

The fee (if any) has been calculated as follows:

FOR	CLAIMS ON FILE AFTER THIS AMENDMENT MINUS HIGHEST NUMBER PREVIOUSLY PAID FOR	NUMBER EXTRA	RATE	CALCULATIONS
TOTAL CLAIMS	22-23	0	x $50.00	$0
INDEPENDENT CLAIMS	1-3	0	x $200.00	$0
MULTIPLE DEPENDENT CLAIM(S) (if not previously paid for and presented for the first time) *			+ $360.00	$0
		TOTAL OF ABOVE CALCULATIONS =		$0
Reduction by ½ for filing by small entity (Note 37 C.F.R. §§ 1.9, 1.27, 1.28).				$0
			SUB TOTAL =	$0
Appeal Brief				$500
			TOTAL =	$500

☒ Please charge $500.00 to the credit card account in the attached Credit Card Payment Form (PTO-2038).

☐ Please charge $ to **Deposit Account No. 501288** referencing docket no. 1176/201.

☒ The Assistant Commissioner is hereby authorized to charge any additional fees under 37 C.F.R. §§ 1.16 and 1.17 that may be required by this transmittal and associated documents, or to credit any overpayment to **Deposit Account No. 501288** referencing docket no. 1176/201. A duplicate copy of this transmittal is enclosed, for that purpose.

Respectfully submitted,

Dated: January 20, 2006

Wen Liu
Registration No. 32,822

LIU & LIU
444 S. Flower Street; Suite 1750
Los Angeles, California 90071
Telephone: (213) 830-5743
Facsimile: (213) 830-5741

CERTIFICATE OF TRANSMISSION BY FACSIMILE

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office Fax No. (571) 273-8300 on January 20, 2006.

Julie Nguyen

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In the application of: Cheng Serial No.: 10/773,624 Filing Date: February 6, 2004 For: METHOD OF FABRICATING SUBSTRATE WITH COLOR FILTER	Examiner: McPherson, John A. Group Art Unit: 1756

APPEAL BRIEF

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Appellant appeals to the Board of Patent Appeals and Interferences from the August 19, 2005 final rejection of the above-identified patent application, comprising Claims 1 and 3-23.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

Toppoly Optoelectronics Corp. owns the entire right, title, and interest in the present application, by virtue of assignment from the inventors, and therefore is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

Appellants are aware of no other appeals or interferences pertaining to the instant invention.

III. STATUS OF CLAIMS

Claim 2 has been canceled, and claims 1 and 3-23 stand finally rejected, as indicated by the Final Office action mailed August 19, 2005. Claims 1 and 3-23 are being appealed. A copy of the claims being appealed is presented in the Claims Appendix attached hereto.

IV. STATUS OF AMENDMENTS

No amendment has been filed subsequent to the Final Office Action.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is the only independent claim being appealed. The subject matter defined in claim 1 relates to a method of fabricating a color filter substrate, which includes planarization of a filler material with respect to colored portions of the color filter, to obtain an even top surface of the color filter layer. Specifically, the method comprises forming a color filter above the substrate, wherein the color filter comprises colored portions adjacent to opening portions, filling the opening portions, and planarizing the colored portions with respect to the filled opening portions, thereby obtaining an even surface for the color filter layer.

Referring to one embodiment of the present invention disclosed in the specification, a color filter layer 2 is supported on a substrate 30. The color filter layer 2 comprises colored

portions 32 (e.g., corresponding to R, G and B colors), opening portions 34 adjacent the color portions 32, and light blocking portions 36 (e.g., black matrix). (See, Fig. 2A, and page 6, line 26 - page 7, line 10 of the specification.) A transparent filler layer 42 covers the color filter layer 2 (e.g., by spin coating), filling the opening portions 34 in the color filter 2. (See, Fig. 2C, and page 8, lines 22-28 of the specification.) The filler layer 42 above the colored potions is removed by planarizing (e.g., by chemical mechanical polishing) the colored portions 32 with respect to the filled opening portions 34. (See, Fig. 2D, and lines 12-16 of the specification.) Using the claimed process, particles of remnant transparent resist are also removed by polishing and thereby obtaining a flat surface and increasing yield.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

(1) Whether the finality of the Office Action dated August 19, 2005 was premature.

(2) Whether claims 1 and 3-23 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,501,521 to Matsushita et al. (hereinafter "US '521") in view of JP 9-230124 (hereinafter "JP '124").

VII. ARGUMENT

A. The Finality of the Office Action Dated August 19, 2005 Was Premature.

In the Office Action dated August 19, 2005 ("Final Office Action"), even though the Examiner relied on the same references as the earlier non-final office action, the Examiner presented a new ground of rejection based on a different interpretation of one of the references. Specifically, in the earlier non-final Office Action dated March 21, 2005, the Examiner stated that US '521 discloses utilizing a flattening film for flattening the surface irregularities of the color filter, not planarizing the colored portions with respect to the filled opened portion (e.g., by polishing). In the Final Office Action, however, the Examiner stated a new basis that in addition

to the embodiment for filling shallow openings with the flattening film, US '521 also discloses the embodiment wherein deep openings are first filled with a transparent resin, then covered with a flattening film. Applicant had not been given an earlier opportunity prior to the Final Office Action to address this new interpretation of US '521. Such new ground of rejection was not necessitated by Applicant's prior amendments, but instead was available to the Examiner in the earlier non-final Office Action. Specifically, in the earlier response filed June 10, 2005, Applicant combined the limitations in original dependent claim 2 into claim 1. Since claim 2 was dependent on claim 1, the scope of claim 2 effectively had not been changed. The Examiner recognized the scope of claim 2 in the earlier non-final action, as he specifically referred to the deficiency of US '521 of not planarizing the colored portions with respect to the filled opened portion. The Examiner should have formulated and set forth all the proper basis for relying on the cited references to make rejections in the non-final Office Action. Failure to do so should entitle Applicant a further opportunity to respond with further amendments to another non-final action. The finality of the Final Office Action should be withdrawn.

B. Claims 1 and 3-23 Are Not Obvious Under 35 U.S.C. § 103(a) Over US '521 and JP '124

To establish a prima facie case of obviousness, three basic criteria must be meet. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references (or references, when combined) must teach or suggest all the claim limitations. See MPEP § 2142.

1. There is No Suggestion or Motivation to Modify or Combine US '521 and JP '124).

One of the requirements for showing obviousness of a rejected claim is providing a suggestion or motivation, in the references themselves or known to those of ordinary skill in the

relevant art, to modify the references or to combine the teachings of the references (In re Geiger, 815 F.2d 686, 2 U.S.P.Q.2d 1276, 1278 (Fed. Cir. 1987); see also MPEP § 2142).

In the earlier non-final Office Action, the Examiner stated that US '521 discloses utilizing a flattening film for flattening the surface irregularities of the color filter, not planarizing the colored portions with respect to the filled opened portion (e.g., by polishing). In the Final Office Action, however, the Examiner stated that "US '521 also discloses the embodiment wherein deep openings are first filled with a transparent resin, then covered with a flattening film, with reference to column 4, lines 51-54." (Emphasis added by Applicant.)

Applicant respectfully notes that the Examiner misconstrued US '521. US '521 does not disclose first filling deep openings with a transparent resin, and then covering the filled opening with a flattening film. In fact, when column 4, lines 51-54 are read in the context of the rest of the paragraph (column 4, lines 40-60), it is clear that according to US '521, once transparent resin of the flattening film is used to fill openings, uniformity is achieved, without requiring any further steps, much less specific planarization steps. In fact, it has been explicitly stated in US '521, at column 4, lines 40-47: "In the liquid crystal display device of the present invention, it is preferred that the openings of the color filter are filled with a transparent resin whose transmittance is 90% or more. In this way, the step around each color filter opening is eliminated, whereby the liquid crystal molecules rise in a uniform manner in the vicinity of each color filter opening, thus improving the contrast (particularly the contrast in a reflection mode)." (Emphasis Added.) The disclosure cannot be more specific or clearer on the point that with the application of transparent resin, it is the objective of US '521 to eliminate the step about the openings of the color filter. The resin filled structure would appear to correspond to the structure of the Fig. 1B referenced in the Background section of the specification of the present application.

Then US '521 goes on to explain that:

> "[a] flattening film made of an acrylic resin is layered on the surface of the color filter for flattening the surface irregularities of the color filter. Thus, when the color filter openings are shallow, the openings are filled with the flattening film. However, when the color filter openings are deep, unless the openings are filled with a transparent resin, the step around each opening cannot be eliminated by the flattening film, thus leaving a step. Particularly when an STN liquid crystal material is used, the liquid crystal molecules rise in a non-uniform manner

in each pixel due to the presence of such a step around each color filter opening, thereby causing significant problems such as a reduction in the contrast in a reflection display mode." (US '521, at column 4, lines 47-60.)

It is clear that the flattening film in US '521 is applied to the surface of the color filter, not the surface of any pre-applied resin. And it is clear that US '521 does not offer any remedy to eliminating the steps around the deep openings. Consequently, there is no teaching, motivation or suggestion if and how the color filter openings can and should be first partially filled with a transparent resin, and then the color filter is covered with a flattening film.

Further, given the overall context of the US '521 disclosure, it effectively teaches away from first filling the color filter openings with resin, and then apply a flattening film. As noted above, US '521 does not require planarization of the resin covered structure or the flattening film covered structure. US '521 in effect teaches away from planarization after a flattening film, or resin-covered structure (claim 5 of the present application specifically requires that planarization step is applied after application of a layer of transparent material). Therefore, US '521 does not contemplate planarization as recited in claim 1. Consequently the combination of JP '124 with US '521 is not proper (McGinley v. Franklin Sports, Inc., 60 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 2001)(references that teach away cannot serve to create a prima facie case of obviousness).

Further, even if the color filter openings are first partially filled with resin and then covered with a flattening film, there is still no motivation or suggestion for planarization of the resultant structure. It would not have been obvious to one skill in the art to modify the process disclosed in US '521 with the planarization process disclosed in JP '124.

There is no incentive or motivation to combine US '521 and JP '124 in the first place. It is clear that the cited references do not contain any suggestion (express or implied) that they can and should be combined, and in any specific manner to obtain the claimed invention. Each cited reference is complete and functional in itself, so there would be no reason to use steps, parts or structures from, or add or substitute steps, parts or structures to another reference. There is therefore no suggestion found anywhere why, if and how US '521 can and should be modified by JP '124. The combination of the references is only possible with impermissible hindsight reconstruction, given the benefit of the disclosure of the present invention.

Accordingly, there is no teaching or suggestion to combine US '521 and JP '124, there is no prima facie case for obviousness, and the obviousness rejection should be reversed (ATD Corporation v. Lydall, Inc., 48 U.S.P.Q.2d 1321, 1329 (Fed. Cir. 1998)(obviousness cannot be determined on hindsight combination; there must be teaching or suggestion within the prior art).

2. There Is No Reasonable Expectation of Success for the Proposed Combination of US '521 and JP '124.

Another requirement for showing obviousness of a rejected claim is demonstrating a reasonable expectation of making a successful combination (see MPEP § 2142). One of ordinary skill in the art would not have a reasonable expectation of success in combining US '521 and JP '124 to produce the claimed invention because U.S. '521 and JP '124 are directed to mutually exclusive paths and reach different solutions to different problems faced by each reference. US '521 specifically chose to use resin filler or flattening film to fill color filter openings to achieve surface flatness. On the other hand, JP '124 removes overlapping color filter portions by planarization. It is not concerned with surface irregularities caused by holes in the color filter. The references effectively teach away (expressly or by implication) from the combination suggested by the Examiner. In fact, US '521 expressly teaches away from requiring any further steps to achieve surface flatness, given there is no further advantage proposed by US '521 that can be achieved by further treating the surface of the resin or flattening film. By application of the flattening layer or filling with resin, the resultant surface is deemed to be acceptable to US '521, without requiring any further surface treatment, such as planarization. The Examiner is essentially requiring one skill in the art to perform mental jumps to consider what could have been done with the prior art disclosure, by applying impermissible hindsight reconstruction given the disclosure of the present invention.

Accordingly, one of ordinary skill in the art would not have a reasonable expectation of success in combining US '521 and JP '124 to produce the claimed invention (Monarch Knitting Machine Corp. v. Sulzer Morat GmbH, 45 U.S.P.Q.2d 1977, 1984 (Fed. Cir. 1998)(references teach away when a person of ordinary skill would be discouraged from following the path taken by the applicant).

3. The Proposed Combination of U.S. '521 and JP '124 Would Not Provide All the Claim Limitations.

(a) Claims 1 and 3-23

Another requirement for showing obviousness of a rejected claim is demonstrating that a proposed combination provides all of the limitations of the rejected claim (see MPEP § 2142). The Examiner's proposed combination of US '521 and JP '124 would not provide all of the limitations for any one of the rejected claims 1 and 3-23.

JP '124 fails to teach color portions being planarized with respect to the filled opening portions. The planarization of the color filter surface in JP '124 is in a completely different context. As clearly shown in Figs. 2 and 3 of JP '124, the overlapping color filter portion 3A is planarized with respect to adjacent color filter portions 3B and 3R/3G. The planarization of the overlapping color filter portion 3A provides an overall flat surface across the various color filter portions 3R, 3G and 3B, which is completely different from planarizing the color portions with respect to filled opening portions, as required by the present invention. Consequently, even if JP '124 can somehow be combined with US '521 in the manner suggested only by the Examiner, the combination does not result in the present invention. The combination of US '521 and JP '124 still would not teach planarizing the colored portions with respect to the filled opening portion, as recited in the claims. Therefore, there is no suggestion to one skill in the art to modify US '521 with the addition of a planarization step. It would be necessary to make modifications, not taught by the combination, in order to combine the references in the manner suggested by the Examiner.

Accordingly, JP '124 does not make up for the deficiencies of US '521, and even if the two references could be combined, they would not provide the claimed combination. Therefore, the rejection of claims 1 and 3-23 should be reversed (In re Nielson, 2 U.S.P.Q.2d 1525, 1528 (Fed. Cir. 1987)(no prima facie case of obviousness where references offered no suggestion of the claimed combination).

(b) Claim 6

Further, with respect to claim 6, it specifically requires the step of spin-coating the layer of transparent material over the colored portions to file the opening portions in the color filter. US '521 does not disclose or suggest spin-coating filler material, since it specifically discloses layering a flattening film on the color filter. JP '124 does not make up for the deficiency of US '521. JP '124 also does not disclose spin-coating a filler material.

VIII. CONCLUSION

Appellants respectfully submit that the Examiner's rejection fail to establish a prima facie case of obviousness under 35 USC §103(a) based on any combination of the cited art under Section 103. In view of the foregoing, Appellants respectfully request that the Board reverse the claim rejections and pass the presently rejected claims on to allowance.

Respectfully submitted,

Dated: January 20, 2006

Wen Liu
Registration No. 32,822

LIU & LIU
444 S. Flower Street; Suite 1750
Los Angeles, California 90071
Telephone: (213) 830-5743
Facsimile: (213) 830-5741

CLAIMS APPENDIX

1. A method of fabricating a substrate with color filter, comprising the steps of:

(a) providing a substrate;

(b) forming a color filter above the substrate, wherein the color filter comprises color portions adjacent to opening portions;

(c) filling the opening portions in the color filter; and

(d) planarizing the colored portions with respect to the filled opening portions.

3. The method as claimed in claim 1, wherein the color filter substrate is of the transflective type, and wherein the colored portions and the opening portions correspond to transmissive areas and reflective areas of the color filter substrate respectively.

4. The method as claimed in claim 1, wherein the step of forming the color portions comprises the steps of spin-coating color photoresists and applying lithographic process to define the color portions.

5. The method as claimed in claim 1, wherein the filling step comprises the step of forming a layer of transparent material over the colored portions and filing the opening portions, and wherein the planarizing step comprises planarizing the colored portions with respect to the opening portions.

6. The method as claimed in claim 5, wherein the step of forming the layer comprises the step of spin-coating.

7. The method as claimed in claim 5, wherein the layer comprises one of a transparent resist material, a transparent light-sensitive material and a heat sensitive material.

8. The method as claimed in claim 1, further comprising the step of forming an electrode layer overlying above the color filter.

9. The method as claimed in claim 8, wherein the electrode layer is a transparent conductive film.

10. The method as claimed in claim 9, further comprising the step of forming a plurality of spacers on the electrode layer.

11. The method as claimed in claim 10, wherein the spacers are formed, comprising the steps of spin-coating photoresist and applying photolithographic process to define the spacers.

12. The method as claimed in claim 1, wherein the planarizing step comprises the step of polishing.

13. The method as claimed in claim 12, wherein the polishing step comprises the step(s) of performing a chemical mechanical polishing (CMP).

14. The method as claimed in claim 1, wherein the color filter forming step forms a color filter that comprises color portions that are uneven, and the planarizing step comprises planarizing the color portions to obtain an even surface.

15. The method as claimed in claim 14, wherein the colored portions extend over underlying structures on the substrate, thereby causing unevenness in the colored portions.

16. The method as claimed in claim 15, further comprising the step of forming light blocking portions adjacent to colored portions on the substrate, wherein the underlying structures comprise the light blocking portions, and wherein the colored portions extends over the light blocking portions.

17. The method as claimed in claim 16, wherein the light blocking portions is formed prior to forming the adjacent colored portions.

18. The method as claimed in claim 16, wherein the planarizing step does not expose the underlying light blocking portions.

19. A color filter fabricated in accordance with the method of claim 1.

20. A method of fabricating a liquid crystal display panel, comprising the steps of:

forming a color filter substrate using the method of claim 1;

providing a liquid crystal display element;

providing an array substrate; and

assembling the color filter substrate and the array substrate with liquid crystal layer therebetween.

21. A liquid crystal display panel fabricated in accordance with the method of claim 20.

22. A liquid crystal display device, comprising:

a liquid crystal display panel of claim 21; and

a controller coupled to the liquid crystal display panel to control the liquid crystal display panel to render an image in accordance with an input.

23. An electronic device, comprising:

a liquid crystal display device of claim 22; and

input device coupled to the controller of the liquid crystal display to render an image.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None